questionable validity in the light of OSTERHOUT'S researches in this line.[32]—C. R. B.

Anatomy of the ovule of Myrica.—Miss KERSHAW[33] has investigated the ovule of *Myrica Gale*, and has discovered that in all of the morphological features it is an ordinary angiosperm, with its solitary megaspore mother cell, linear tetrad, eight-nucleate embryo sac, and porogamy. The following anatomical features, however, are worthy of mention: the nucellus is not only completely free from the single integument but is also distinctly stalked within it; vascular strands (eight or nine in number) traverse the integument, without branching, almost to the apex of the ovule. These two features of the ovule are usually regarded as primitive, belonging to the ancient gymnosperms rather than to angiosperms.—J. M. C.

Phototropism of roots.—LINSBAUER and VOUK, after overcoming many experimental difficulties, have found[34] that the roots of *Raphanus sativus* and *Sinapis alba*, which have been credited with being only negatively phototropic, react positively or negatively according to the intensity of the light. Roots of the former in moist air turn toward light of about 8 candles, while in water they are much less sensitive, no very certain curvatures being obtained until the light was increased to 400 c.p. Sinapis in water, on the contrary, gave the best positive response at 0.2 c.p., and decided negative curvatures at 0.64 c.p. These results support the MÜLLER-OLTMANNS theory of phototropism.—C. R. B.

Dispersal of seeds by ants.—WEISS[35] has concluded that the gorse (Ulex) and the broom (Sarothamnus) should be included among myrmecochorous plants, along with Chelidonium, Viola, etc. He finds that the seeds have a brightly colored caruncle containing oily food material and resembling in structure and contents the elaiosomes (of SERNANDER) of other myrmecochorous plants; that ants are particularly attracted by the oil-containing caruncle, and can and will carry about the seeds of gorse; and that the rectilinear distribution of gorse bushes along actual or disused paths or roadways is only paralleled by the distribution of such plants as the celandine along ant-runs.—J. M. C.

Anatomy of Gleichenia.—BOODLE and HILEY[36] have investigated the vascular structure of Gleichenia, a genus interesting on account of its protostelic species.

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[32] BOT. GAZETTE **46**:53–55. 1908.

[33] KERSHAW, EDITH MAY, The structure and development of the ovule of *Myrica Gale*. Annals of Botany **23**:353–362. *pl. 24*. 1909.

[34] LINSBAUER, K., AND VOUK, V., Zur Kenntnis des Heliotropismus der Wurzeln. Ber. Deutsch. Bot. Gesells. **27**:151–156. 1909.

[35] WEISS, F. E., The dispersal of the seeds of the gorse and the broom by ants. New Phytol. **8**:81–89. 1909.

[36] BOODLE, L. A., AND HILEY, W. E., On the vascular structure of some species of Gleichenia. Annals of Botany **23**:419–432. *pl. 29*. 1909.

G. pectinata was especially studied, whose rhizome BOODLE[37] had discovered to be solenostelic. This has now been confirmed, solenostely with leaf gaps being found. It is concluded that Eugleichenia represents a series of reduction forms from the Mertensia type (represented by *G. flabellata*), and that Mertensia includes the most primitive species as well as the most advanced (*G. pectinata*), in which a solenostelic structure has been derived from a protostelic.—J. M. C.

Ovule of Julianiaceae.—Miss KERSHAW[38] sees in the integumental vascular strands and free nucleus of this recently established Mexican family a suggestion of relationship between Juliania and Juglans, and especially in the association of this structure in both genera with the outgrowth at the base of the ovule known as the obturator. The suggested connection with Anacardiaceae is confirmed by the integumental vascular strands of Mangifera, but in that genus there is no indication of an obturator.—J. M. C.

Chlorophyll in evergreens.—Miss CÄCILIE STEIN reports[39] that crude chlorophyll (i. e., all the pigments) increases in amount with the season, and from February to March far more than from March to May; from that time on it seems about constant. The chlorophyll proper increases likewise and decidedly more than the xanthophyll. This, she suggests, may be due to the conversion of the xanthophyll into chlorophyll; but KOHL'S experiments strongly antagonize such an explanation.—C. R. B.

Stock and scion.—At a meeting of the Botanical Society of France last March GRIFFON discussed the results of his numerous experiments in grafting during 1908,[40] and declared that, whatever the plants employed (Solanaceae, Leguminosae, Compositae), and whether the graft was simple or mixed, there was no trace of asexual hybridization, but further confirmation of the specific independence of the stock and scion.—C. R. B.

An abnormal Funaria.—DIXON[41] describes a plant of *Funaria hygrometrica* from Tonduff having the perigonial leaves fringed by a double row of protuberant and more or less flask-shaped cells which are supposed to function as reservoirs of water supplementary to the paraphyses for keeping the antheridia well supplied. —C. R. B.

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[37] BOODLE, L. A., On the anatomy of the Gleicheniaceae. Annals of Botany **15**:703. 1901.

[38] KERSHAW, E. M., Note on the relationship of the Julianiaceae. Annals of Botany **23**:336, 337. 1909.

[39] STEIN, CÄCILIE, Beiträge zur Kenntnis der Enstehung des Chlorophyllpigmentes in den Blättern immergrüner Koniferen. Oesterr. Bot. Zeits. **59**:231–245, 262–269. 1909.

[40] GRIFFON, E., Troisième série de recherches sur la greffe des plantes herbacées. Bull. Soc. Bot. France **56**:203–210. *pls. 3, 4.* 1909.

[41] DIXON, H. N., A remarkable form of *Funaria hygrometrica*. Bryologist **12**:49–51. *pl. 5.* 1909.